

What is claimed is:

- 1        1.        An apparatus comprising:  
2                an embossing tool substrate made of a first metal, a first major surface of the  
3        substrate having an embossing profile;  
4                a first coating over the first major surface of the substrate, the first coating  
5        providing an adherable surface; and  
6                a second coating over the first coating, the second coating providing a non-  
7        adhesive outer surface.
- 1        2.        The apparatus of claim 1, wherein the first coating further comprises:  
2                a layer of a second metal deposited over the embossing tool substrate;  
3                a layer of metal oxide deposited over the layer of the second metal; and  
4                a layer of metal nitride deposited over the layer of metal nitride.
- 1        3.        The apparatus of claim 1, wherein the first coating further comprises:  
2                a layer of zirconium deposited over the embossing tool substrate;  
3                a layer of zirconium oxide deposited over the layer of zirconium; and  
4                a layer of zirconium nitride deposited over the layer of zirconium oxide.
- 1        4.        The apparatus of claim 1, wherein the second coating comprises poly-para-  
2        xylylene.
- 1        5.        The apparatus of claim 3, wherein the zirconium layer is about 0.5 microns  
2        thick, the zirconium oxide layer is about 0.5 microns thick, the zirconium nitride  
3        layer is about 0.5 microns thick, and the second coating comprises poly-para-  
4        xylylene and is between about 2 microns and about 9 microns thick.
- 1        6.        The apparatus of claim 5, wherein the zirconium layer is 0.5 microns thick,  
2        the zirconium oxide layer is 0.5 microns thick, the zirconium nitride layer is 0.5

3           microns thick, and the second coating is between 2 microns and 9 microns thick.

1           7.       The apparatus of claim 3, wherein the second coating comprises Parylene  
2           Nova HT.

1           8.       The apparatus of claim 2, wherein the second coating comprises  
2           poly-para-xylylene.

1           9.       The apparatus of claim 2, wherein the second coating comprises  
2           Parylene Nova HT.

1           10.      The apparatus of claim 1, wherein the second coating comprises  
2           Parylene Nova HT.

1           11.      The apparatus of claim 1, further comprising:  
2                    a heater apparatus to provide heat during an embossing operation; and  
3                    a pressure apparatus to apply pressure during the embossing operation.

1           12.      The apparatus of claim 1, wherein the first coating further comprises a layer  
2           of zirconium deposited over the embossing tool substrate, and wherein the second  
3           coating comprises zirconium nitride deposited over the layer of zirconium.

1           13.      A method comprising:  
2                    providing an embossed tool substrate;  
3                    depositing a first coating over the first major surface of the substrate, the  
4           first coating providing an adherable surface; and  
5                    depositing a second coating over the first coating, the second coating  
6           providing a non-adhesive outer surface.

1        14.     The method of claim 13, wherein the depositing of the first coating further  
2 comprises:

3             depositing a layer of metal over the embossing tool substrate;  
4             depositing a layer of metal oxide deposited over the layer of the metal; and  
5             depositing a layer of metal nitride deposited over the layer of metal oxide.

1        15.     The method of claim 13, wherein the depositing of the first coating further  
2 comprises:

3             depositing a layer of zirconium deposited over the embossing tool substrate;  
4             depositing a layer of zirconium oxide deposited over the layer of zirconium;  
5             and  
6             depositing a layer of zirconium nitride deposited over the layer of zirconium  
7 oxide.

1        16.     The method of claim 13, wherein the depositing of the first coating further  
2 comprises:

3             depositing a layer of zirconium over the embossing tool substrate; and  
4             wherein the depositing of the second coating further comprises depositing a  
5 layer of zirconium nitride over the layer of zirconium.

1        17.     The method of claim 13, wherein the depositing of the second coating  
2 further comprises depositing poly-para-xylylene.

1        18.     The method of claim 15, wherein the zirconium layer is deposited to about  
2 0.5 microns thick, the zirconium oxide layer is deposited to about 0.5 microns thick,  
3 the zirconium nitride layer is deposited to about 0.5 microns thick, and the  
4 depositing of the second coating further comprises depositing poly-para-xylylene to  
5 between about 2 microns and about 9 microns thick.

1        19.     The method of claim 18, wherein the zirconium layer is deposited to 0.5  
2        microns thick, the zirconium oxide layer is deposited to 0.5 microns thick, the  
3        zirconium nitride layer is deposited to 0.5 microns thick, and the depositing of the  
4        second coating comprises depositing the poly-para-xylylene to between 2 microns  
5        and 9 microns thick.

1        20.     The method of claim 13, wherein the depositing of the second coating  
2        further comprises depositing Parylene Nova HT.

1        21.     The method of claim 13, further comprising:  
2                heating an embossable substrate during an embossing operation; and  
3                applying pressure during the embossing operation.

1        22.     The method of claim 13, wherein the first and second coatings provide an  
2        embossable substrate and further comprising:  
3                embossing the embossable substrate by applying heat and pressing the  
4        embossing tool substrate into the embossable substrate.

1        23.     An apparatus comprising:  
2                an embossing tool that includes:  
3                        a tool substrate base; and  
4                        means attached to the tool substrate base for providing a hardened  
5                embossing surface with reduced adherence properties to an embossable  
6                substrate.

1        24.     The apparatus of claim 23, further comprising:  
2                means for providing an embossable surface including a polymer film having  
3        attached thereto means for releasing the embossing tool, mixed with an epoxy resin.  
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1        25.     The apparatus of claim 23, wherein the means for providing a hardened  
2        embossing surface with reduced adherence properties includes a layer of zirconium  
3        on the tool substrate base and a layer of zirconium nitride on the layer of zirconium.

1        26.     The apparatus of claim 25, wherein the means for providing a hardened  
2        embossing surface with reduced adherence properties further includes a layer of  
3        zirconium oxide on the layer of zirconium nitride, and a layer of poly-para-xylylene  
4        on the layer of zirconium oxide.